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PRELIMINARY REPORT ON THE PLEIDAE (HEMIPTERA) OF
THE AMERICAS

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Species of the genus *Plea* Leach (1817) are very small compact waterbugs found in tangles of aquatic vegetation in stagnant ponds, swamps, bogs, sluggish drainage ditches, secluded coves in lakes and the more sluggish parts of slowly moving streams. If fairly permanent, the smaller bodies of stagnant standing waters are more favorable to mass development of these insects than are the larger. And generally speaking, pleids in preferred habitats in standing waters usually outnumber those living in the more favorable abodes in streams. Although the legs are ambulatory, the hind pair is fitted for swimming by the presence of two rows of extremely long hairs. The first and second tarsi are composed of two or three segments and the posterior of three. The thoracic sternites and the second to fifth (sometimes also the sixth) abdominal ventrites are provided with laminate carinae along the median longitudinal line.

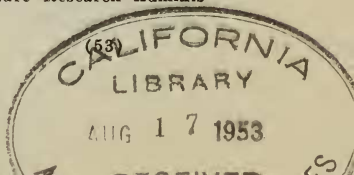
On account of their inconspicuous color and small size, varying from 1.50-3.00 mm. in length, pleids are frequently overlooked and poorly represented in collections. Two species of *Plea* (*P. striola* Fieber and *P. harnedi* Drake) from the United States, two (*P. puella* Barber and *P. punctifer* Barber) from the West Indies and two (*P. maculosa* Berg and *P. borellii* Kirkaldy) from Argentina have been described from the Western Hemisphere. *P. borellii* is unknown to the authors. We have one specimen of a species from Puerto Rico, which we have tentatively determined as *P. punctifer*.

In addition to notes on four of the above species, the present paper contains the descriptions of six new species from the Americas. It should be noted that *P. puella* Barber and *P. nilionis*, n. sp. belong to the subgenus *Paraplea* Esaki and China and the rest of the old and new forms herein described to the subgenus *Neoplea* Esaki and China. Specimens of *Plea* (*Plea*) *minutissima* (Fabricius) from the Old World have been studied. The types of the new species are in the Drake Collection, paratypes in the collections of both authors.

On account of the similar general aspect, variation in color, semi-globose form and small size (sometimes very little, if any, difference between species in length), the species are difficult to identify and often

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much confused. In a subsequent paper the authors plan to publish illustrations of antennae, opercula of male and female, elytra, male parameres, female ovipositors, and the median laminate carinae on sterna and venter. Shape of body and punctures are also of specific value. Two species, *P. argentina*, n. sp. and *P. nilionis*, n. sp., have much larger scutelli than other members of their respective subgenera. As the salient structures for the separation of species are small, the differences can be much better depicted by illustrations than words.

Some species, such as *P. striola* (Fieber) and *P. harnedi* Drake, often exhibit marked variations in color, especially between the forms with and without claval suture. In these two species, specimens with distinct claval suture are usually prominently marked with dark brown or dark fuscous, whereas individuals with clavus and corium solidly fused (without trace of suture) are generally plainly colored. The claval suture, when present, is long and terminates on the commissural suture beyond the apex of scutellum. The clavulus is very distinct, but fused to the side of the pleuron and thus not movable with the elytron. Flight wings are fully developed or vestigial; when fully developed, they are folded back under the elytra in repose.

Esaki and China (1928, EOS, Rev. Esp. Ent., 4(2):166) separates the subgenera of the genus *Plea* as follows:

Plea Leach. Tarsal segments—3, 3, 3; abdominal carinae on ventrites 2nd-6th. Distribution: Palearctic. Type, *P. minutissima* Fabr.

Paraplea Esaki and China. Tarsal segments—2, 2, 3; abdominal carinae on ventrites 2nd-6th. Distribution: North American, Oriental and Australasian. Type, *P. pallescens* Distant.

Neoplea Esaki and China. Tarsal segments—3, 2, 3; Abdominal carinae on ventrites 2nd-5th. Distribution: Western Hemisphere. Type, *P. striola* (Fieber).

Plea puella Barber

Plea puella Barber, Am. Mus. Nov., 1923, 75, p. 11

Plea puella Barber, N. Y. Acad. Sci., 14(3):417-418, 1 fig. 1939.

Described from a series of specimens from Puerto Rico. As this striking species has the tarsal formula two-two-three and abdominal carinae on second to sixth segments of the venter, it falls into the subgenus *Paraplea* E. & C. *Puella* and the new species described below (*nilionis*), can easily be separated from the rest of the American pleids by the subgeneric characters. The spine-like pegs on the female ovipositors are much smaller and fewer in numbers. The scutellum is also distinctly smaller, punctures more prominent and body smaller.

Puella is widely distributed in the West Indies, Central America, Mexico and Gulf States. Specimens have been studied from Puerto Rico (Mayaquez, J. Madonaldo Capriles and H. D. Tate); Panama (Canal Zone, Feb. 10-12, 1939, C. J. Drake); Trinidad, B. W. I. (Oct. 27-29, 1938, C. J. Drake); Mexico (Alvarado, July 28, 1951; Ciudad Valles, Aug. 8, 1951; Acapulco, Aug. 3, 1951, all by C. J. Drake); and Gulf States (Ocean Springs, Miss., Aug. 17, 1951, C. A. Wilson; Center Hill, Fla., 1951-1953, H. C. Chapman). The specimens from Mexico, Trinidad, Panama and Florida (U. S.) were taken in tangles of aquatic plants in stagnant ponds, pools and drainage ditches. Nymphs have all tarsal one-segment.

Plea nilionis, sp. new

Small, elongate, grayish testaceous, without definite color markings, moderately shining, rather strongly convex above, coarsely honeycombed, with punctures largely visible but not deeply colored, pits largely brownish or fuscous. Tarsal segments two-two-three, subgenus *Paraplea* E. & C. Length, 1.88 mm.; width, 0.90 mm.

Width of head across eyes, 0.80 mm. Head with a median yellow stripe, the vertex a little more than twice the width of an eye. Eyes reddish brown. Pronotum much wider than long (76:50), strongly transversely convex. Scutellum large, wider than long (40:36). Elytra long, strongly declivous behind. Coarsely widely reticulate, punctures in cells largely visible and darkened; clavus moderately wide, long, distinctly separated from clavus; clavulus narrow, fused to pleuron, sutured-off from elytron. Median sternal ridges strongly laminate, much lower on segments two to six of venter. Female ovipositor with small spine-like pegs.

Type (male) and *allotype* (female), Ormond Beach, Fla., Oct. 13, 1952, taken among aquatic plants near the shore of a stream. One example of *P. notana*, n. sp. was also found in the same habitat.

Differs from *P. puella* (only other American member of the subgenus) by the more elongate form, larger scutellum (*nilionis*, 40:36; *puella*, 34:30), distinctly longer elytra, thicker body dorso-ventrally and less prominent punctures. In general aspect it looks more like *P. argentina* of South America, but is easily separated from it as well as other American species of subgenus *Neoplea* E. & C. by the two-segmented anterior tarsi. For one of the smaller species, *argentina*, n. sp. also has an unusually large scutellum.

Plea striola (Fieber)

Ploa striola Fieber, Ent. Monog., 1844, p. 18, 4 figs.

Plea striola Uhler, Stand. Nat. Hist., 2:253. 1884.

Plea striola Torre-Bueno, Can. Ent., 44:213. 1912.

Plea striola Hungerford, Sci. Bull., Univ. Kan., 21(17):165-166. 1919.

Plea striola Van Duzee, Cat. Hem., 1917, p. 456.

This species is widely disseminated in United States and southern Canada. The type, described from North America as *Ploa striola* Fieber, is in the Weiner Museum. Records of its occurrence in the West Indies, Mexico and Central America as well as from the southern and western parts of the United States need to be verified as a complex of three or four different species have been wrongly labeled *striola* for many years. In the Gulf States *striola* is not as common as *P. harnedi* Drake, *P. puella* Barber, *P. notana*, n. sp. and *P. apokana*, n. sp. The references to *striola* by Champion (Biol. Cent.-Amer., Rhyneh., 1901, 2:375, 1 fig.) Uhler (Proc. Zool. Soc. London, 1893, p. 706; *ibid.*, 1894, p. 224) and Van Duzee (Cat. Hemip., 1917, p. 456) probably involve a complex group of species.

Many hundred specimens of *striola* have been examined from Iowa, Neb., Utah, Ill., Ind., Mich., Ohio, N. Y., Pa., Va., W. Va., Md., Miss., Fla. and eastern Canada. Among this material we have found a number of specimens with a distinct claval suture (clavus and corium completely differentiated) from Iowa (Boone), Nebraska (Valentine) and

Michigan (East Lansing). Curiously enough, this form (as a rule rare) with the claval suture is distinctly marked with deep brown or dark fuscous. The common form (clavus and corium completely fused and without a trace of claval suture) are pale testaceous or cinereous and without definitely shaded areas. The wings are vestigial, or fully developed and functional. *Striola* is the largest and most widely distributed member of the genus occurring north of the Mexican boundary.

Plea maculosa Berg.

Plea maculosa Berg, Hem. Arg., 1879, pp. 199-200.

Plea maculosa Pennington, Lista Hem.-Het. Arg., 1921, p. 32.

Type (male) and allotype (female), Buenos Aires, Arg., both mounted on the same rectangular card, and one paratype (on a separate card and pin, bearing the same data as type), deposited in the La Plata Museum, La Plata, Arg., have been studied. Other specimens from Argentina (Tigre, Buenos Aires, Dec. 10, 1938; Lujan, Dec. 18, 1938, all by C. J. Drake); and Peru (Pucallpa, July-August, 1945) agree with the type in size, form, punctures, color and markings. From the original description, it seems quite evident that Berg had two different species before him when he characterized *maculosa*. *P. absona*, n. sp. occurs at times in the same habitat as *maculosa* in the vicinity of Buenos Aires.

P. maculosa is practically the same size as *P. striola*, but is a little more convex above. Specimens with distinct claval suture (form without claval suture unknown) are conspicuously marked with dark brown or dark fuscous. The female ovipositors bear large peg-like spines. *P. argentina*, n. sp. is a smaller and slender species with a large scutellum. Another species described from the Argentine, *P. borellii* Kirkaldy (Boll. Mus. Zool. ed. Anat. comp., 15 (352):1-2, 1899) is unusually large for a *Plea* (3.00-3.50 mm. long and 2.00 mm. wide), and unknown to the writers. From the original description it appears to belong to a different genus.

Plea mexicana, sp. new

Large, very robust, greyish testaceous without color markings, moderately shining, rather closely reticulate, punctures not always darkened and thus not very visible. Claval suture sharply defined. Tarsi composed of three, two and three segments. Length 2.52 mm.; width, 1.38 mm. Subgenus *Neoplea* E. & C.

Width of head across eyes, 1.25 mm.; distance between eyes a little more than twice the width of an eye. Head slightly embrowned in front on median line. Eyes large, brownish. Legs testaceous with coxae, trochanters and narrow basal part of femora dark ferruginous. Body beneath largely fuscous. Dorsal surface strongly convex, with rather small honeycombed cells; punctures mostly not darkened and then not always discernible. Pronotum almost twice as wide as long. Scutellum glassy, with punctures mostly invisible, wider than long (64:50). Elytra divided into clavus and corium, with reticulated cells the same size as on pronotum; clavus not quite as wide as half of the basal width of scutellum; clavulus large, distinct, fused to pleuron.

Type (female ?), Veraacruz, Mex., taken in sluggish part of a small

stream, July 29, 1950, C. J. Drake. As the operculum is not plainly visible, it is impossible to be certain of sex without removing genital structures.

This species may be easily separated from *P. striola* and *P. punctifer* by its slightly longer and much broader body, punctures and reticulations. The honeycombed reticulations are much larger in *striola* and a little smaller in *punctifer* with pits quite prominent. *P. mexicana* is by far the broadest species of the North America pleids.

Plea harnedi Drake

Plea harnedi Drake, Ohio Jr. Sci., 22:114, 2 figs. 1922.

Plea harnedi Blatchley, Heter. East. North Amer. 1926, p. 1061.

Plea harnedi Hungerford, Carn. Inst. Wash., Pub. No. 457, 1936, p. 149.

Plea striola Ellis, Proc. Ent. Soc. Wash., 52(2):104-105, 10 figs. 1950.

Type series, 7 specimens, all with distinct claval suture and marked with dark brown or deep fuscous, Fayette, Miss., July 23, 1921, taken in a small pond. In addition to the types (holotype male), specimens have been examined from Florida (Gainesville and Orlando), Mississippi (Columbus and State College), Louisiana (St. Charles Parish), Panama (Canal Zone) and Mexico (Puebla, Alvarado, Acapulco and Ciudad Victoria). Hungerford (1936) also records *harnedi* from Yucatan, Mex.

Specimens of *P. harnedi* can be divided into three groups:—(1) individuals with sharply defined claval suture (clavus and corium separated); (2) clavus and corium completely fused into one solid piece (no claval suture); and (3) intermediate forms with claval suture more or less partly indicated but not entirely formed. Color variations are also quite characteristic of *harnedi*. Specimens without any trace of a claval suture are generally grayish testaceous without definite color markings, whereas individuals with distinct claval suture are usually prominently marked with dark brown and deep fuscous. Intermediate forms (clavus more or less faintly indicated) are quite variable in color and exhibit almost all degrees of variation from grayish testaceous to prominent markings of dark brown or deep fuscous. Teneral specimens, killed almost immediately after the last moult, are largely whitish testaceous; and if killed at intervals after emergence before the color is fully formed and indurated, they exhibit much variation in the intensity of color pattern. In such species as *striola* and *harnedi*, the presence or absence of claval suture as well as color markings are not characters for the separation of species. The presence or absence of claval suture is characteristic of most species of American pleids. Color and color markings (if present) are more or less singular to the species concerned.

In the Heteroptera of Eastern North America, Blatchley (1926, p. 1061) suggests that *harnedi* may not be more than a variety of *striola*. Twenty-four years later, Ellis (1950, pp. 104-105) followed Blatchley's suggestion and suppressed *harnedi* as a synonym of *striola*. An examination of a series of specimens from Louisiana shows that Ellis had 168 specimens of *harnedi* before him, but no examples of *striola*; and thus his studies on the variations in color and size as well as the presence or absence of claval suture apply entirely to males and females of *harnedi*. Blatchley based his assumption entirely upon specimens of *striola*. These two names apply to different species. *Harnedi* ranges from the Gulf

States south across Mexico and Central America into Panama. *Striola* ranges through the larger part of United States and southern Canada, but records from the West Indies and Central America need to be verified as several species have been confused with it in the literature. *Harnedi* is smaller than *striola* with reticulations smaller and punctures considerably embrowned, whereas *striola* is a wider and deeper species. As in the case of most other American species of the subgenus *Neoplea*, the antennae, parameres, ovipositors and opercula are small and require figures to illustrate the differences.

Plea absona, sp. new

Very small, honeycombed, punctures not plainly visible, moderately shining, without color markings. Claval suture absent in type (completely fused with corium), but feebly indicated in paratype. Tarsal segments, three-two-three. Median sternal keels strongly foliaceous; median keels present on ventrites two-five of abdomen. Subgenus *Neoplea* E. & C. Length, 1.65 mm.; width, 0.90 mm.

Width across head, 0.85 mm; vertex scarcely more than twice the breadth of an eye. Eyes dark brownish or fuscous. Pronotum coarsely reticulate, with punctures indistinct, practically twice as wide as long. Dorsal surface slightly less arched and not as sharply declivous behind as in *P. maculosa*. Flight wings fully developed. Clavulus shorter than in *maculosa*. Legs rather long, pale.

Type (male) and 1 *paratype*, taken at low tide in a small drainage ditch, Tigre, Province of Buenos Aires, Arg., Dec. 10, 1938, C. J. Drake.

The much smaller size and less arched dorsal surface separate at once this little species from *P. maculosa*. It is also shorter and not as thick dorso-ventrally, and the total area of the scutellum is less than one-third that of *P. argentina*, n. sp.

Plea argentina, sp. new

Small, moderately convex above, slightly shining, grayish testaceous with faintly brownish or fuscous areas but without definite color marks. Claval suture very distinct. Dorsal surface convex, the pronotum and elytra with honeycombed surfaces and cellular punctures. Length, 2.00 mm.; width, 0.95 mm. Tarsal segments, three-two-three. Subgenus *Neoplea* E. & C.

Width across eyes, 0.85 mm.; vertex hardly more than twice the width of an eye. Eyes reddish fuscous. Pronotum slightly more than one and one-half times as wide as long, transversely convex, the cells largely distinct and pitted. Scutellum remarkably large for a small species, smooth, shining, the punctures not discernible, strongly acuminate apically, the width at base and median length practically equal (46:46). Elytra with honeycomb-like cells largely distinct and punctate, strongly declivous behind; claval suture deep, the clavus long and terminating beyond apex of scutellum on commissure of elytra. Flight wings fully developed, functional, folded back under elytra. Fore and hind tarsi three-segmented, the middle tarsi each with two segments.

Type, male, Lujan, Province of Buenos Aires, Arg., taken in quiet parts of a small stream, Dec. 18, 1938, by C. J. Drake.

This species has a little longer and deeper body, and the scutellum

is very much larger than in *P. absona*, n. sp. On account of the strongly acuminate apex, the scutellum appears longer (actually subequal) to the eye than wide (46:46), whereas in *absona* it is distinctly wider than long (30:21). *P. maculosa* is a larger stouter species and prominently marked with dark fuscous; it is most closely related to *P. striola* of North America.

Plea notana, sp. new

Rather small, moderately elongate, narrowed behind, grayish testaceous with very large dark fuscous markings so as to make the general color appear quite dark, moderately shining, reticulate, with deep dark pits in cells. Tarsi composed of three-two-three segments. Median carinae on segments two-five of venter. Dorsal surface convex above, not sharply declivous behind. Subgenus *Neoplea* E. & C. Length, 1.90 mm; width, 0.90 mm.

Head with a large basal dark fuscous spot; width across eyes, 0.87 mm. Pronotum much wider than long (80:46). Elytra with large dark fuscous areas, with or without claval suture, tapering a little posteriorly, not as sharply declivous behind as in *P. apopkana*, n. sp. Honeycombed reticulations mostly distinct, the pits deep and usually prominent. Scutellum wider than long (35:28). Clavulus distinct, fused to pleuron, sutured-off from elytra. Dorsal surface strongly convex with highest point near apex of scutellum. Legs testaceous to brown, darker basally. Body beneath dark brown to fuscous. Female ovipositors with peg-like spines. Flight wings folded back under elytra.

Type (male), and *allotype* (female), Mims, Fla., Nov. 8, 1952. *Paratypes*; 2 specimens, Biloxi, Miss., 1921; and numerous specimens, Mims, Fla. 1952-1953, H. C. Chapman.

Most closely allied to *P. apopkana*, n. sp. but easily distinguishable by its more elongate form, darker color, and the elytra not so sharply declivous behind.

Plea apopkana, sp. new

Small, robust, grayish testaceous with large fuscous markings, reticulations moderately large with punctures largely distinct. Tarsi composed of three-two-three segments. Median carinae present on ventrites second-fifth of abdomen. Subgenus *Neoplea* E. & C. Length, 1.95 mm.; width, 1.12 mm.

Head with a large triangular fuscous spot at its base, with a median yellowish stripe in front of spot. Eyes reddish fuscous. Dorsal surface of body strongly convex, rather sharply declivous behind. Pronotum fuscous in front, honeycomb-like cells distinct, moderately large. Scutellum fuscous, with pits mostly indistinct, wider at base than long (42:30). Elytra with cells same size as on pronotum, with fuscous markings, with or without claval suture. Legs testaceous to brownish. Body beneath dark fuscous. Body posteriorly little narrowed.

Type (male) and *allotype* (female), Apopka, Fla., Nov. 8, 1952. *Paratypes* (numerous specimens): Center Hill, Ormond Beach, Mims, and Apopka, Fla., 1952-1953, H. C. Chapman; Ocean Springs, Miss., July, 1921.

Allied to *P. notana*, n. sp. but easily distinguishable by the more robust form, lighter color, larger cells. It is much smaller than *striola* and longer and thicker than *puella*. Parameres are also different.